

NEW GENUS AND SPECIES OF AHERMATYPIC CORAL  
(ANTHOZOA: SCLERACTINIA)  
FROM THE WESTERN ATLANTIC

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*Abstract.*—A new genus and species are described in the subfamily Parasmiliinae. *Bathycyathus maculatus* Pourtalès, 1874 is transferred to the new genus. Both species are characterized by having paliform lobes before the penultimate cycle of septa and an identical method of basal reinforcement. [Scleractinia; *Rhizosmilia*; Parasmiliinae.]

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Numerous species have been uncritically placed in the genera *Bathycyathus* and *Coenocyathus*. One of these is *Bathycyathus maculatus* Pourtalès, 1874 (= *Caryophyllia maculata*, Pourtalès, 1880; Wells, 1972; Cairns, 1977; *Coenocyathus bartschi* Wells, 1947). A re-examination of *B. maculatus* indicates that it has endothecal dissepiments (Plate 1, Fig. 8), which would transfer it from the Caryophylliinae to the Parasmiliinae. It is necessary to describe a new parasmilid genus to contain both *B. maculatus* and another undescribed species.

Some of the specimens used in this study were collected by the R/V *Gerda* in the Deep-Sea Biology Program sponsored by the National Geographic Society. Ship time was supported by a National Science Foundation grant. This is a contribution from the Rosenstiel School of Marine and Atmospheric Science, University of Miami.

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All of the specimens listed in this paper are deposited at the National Museum of Natural History (USNM).

Suborder Caryophylliina Vaughan and Wells, 1943

Family Caryophylliidae Gray, 1847

Subfamily Parasmiliinae Vaughan and Wells, 1943

*Rhizosmilia*, new genus

*Diagnosis.*—Small phaceloid clumped colonies formed by extratentacular budding. Corallite bases increase in diameter by adding exothecal dissepiments over raised costae producing concentric rings of partitioned chambers. Paliform lobes present before penultimate cycle. Columella prominent, varying from spongy to fascicular (a line of pillars) to lamellar. Endothecal dissepiments present.

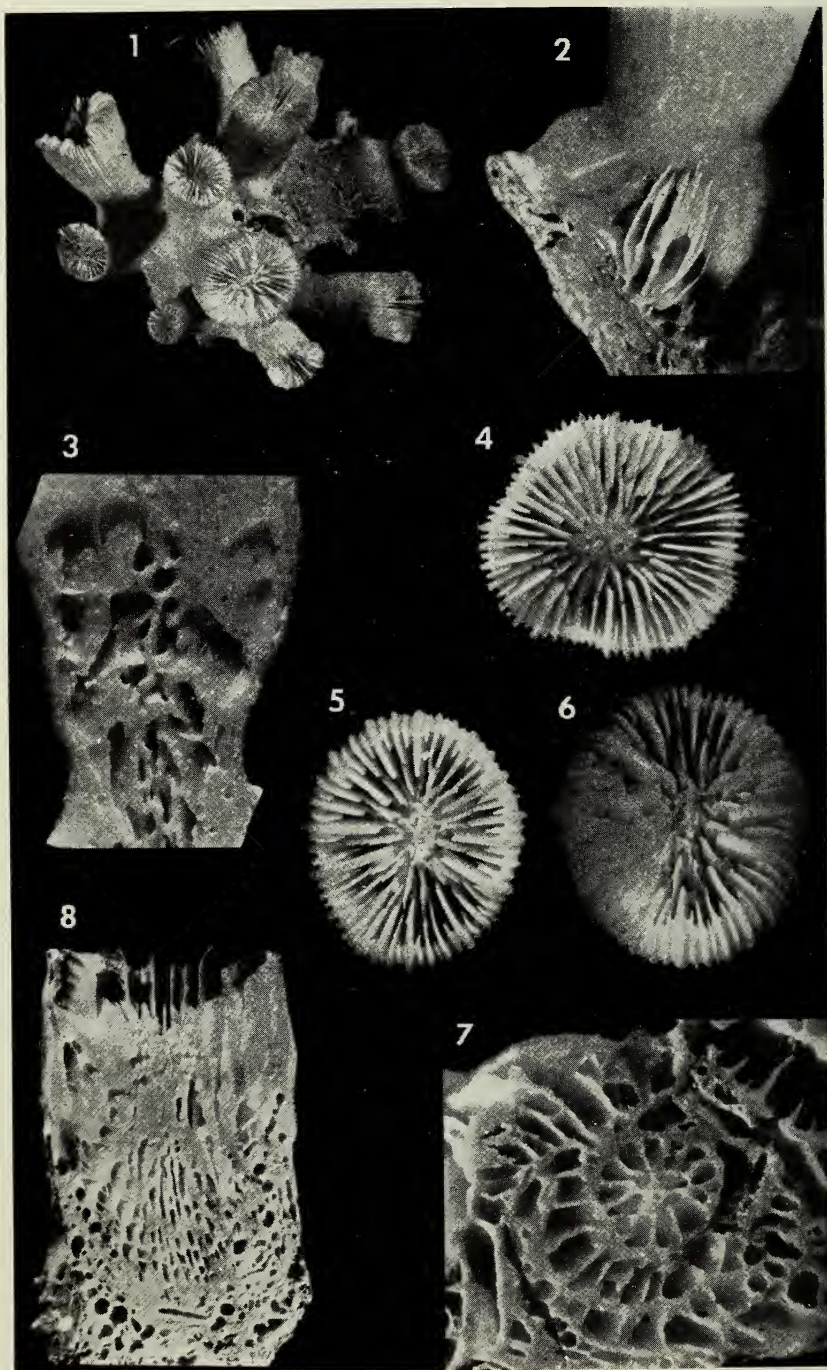
*Type-species.*—*Rhizosmilia gerdae*, n. sp., here designated.

*Discussion.*—*Rhizosmilia* is easily distinguished from the other genera in the subfamily Parasmiliinae by a combination of three easily observed characters: it is colonial (clumped phaceloid), has a prominent columella, and has large paliform lobes.

The position of the paliform lobes before the penultimate cycle of septa requires explanation. The first paliform lobes to form are the 12 that border the  $S_3$  at the 48-septa stage (Fig. 1a). When a pair of  $S_5$  appears within a half-system, one of two things occurs to maintain the paliform lobes before the penultimate cycle: 1) the original  $P_3$  may remain stationary before the  $S_3$  while an independent lobe forms on the accelerated  $S_4$  (Fig. 1b), or 2) the original  $P_3$  may gradually begin to align with the accelerated  $S_4$ , maintaining trabecular connections with both  $S_3$  and  $S_4$  simultaneously (Fig. 1c). With greater development, this transitional paliform lobe becomes completely aligned and attached to the  $S_4$  (Figs. 1d, e). (For example, every transitional  $P_4$  merges with a  $P_3$  lower in the fossa.) When the second pair of  $S_5$  occurs in the half-system, if the  $P_3$  is still present (case 1), it becomes a transitional lobe and forms the  $P_4$ . If the  $P_3$  has already aligned with the other  $S_4$  (case 2), then an independent lobe is formed of equal size on the second  $S_4$ . In both cases, the final condition is two equal paliform lobes bordering the  $S_4$  (penultimate cycle) and no lobe visible before the  $S_3$  (Fig. 1f).

Both species in this genus also have a peculiar method of basal reinforcement. As the corallite increases in size, the edge zone secretes thin costae, up to 2 mm high and 10 mm long, perpendicular to the corallum wall around the base (Plate 1, Fig. 2). Next, exothecal dissepiments form over the costae, producing a series of chambers around the base. This process may occur several times, producing 4–5 concentric rings of hollow compartments that substantially increase the basal diameter of the corallite and therefore its stability. If a transverse section is made through the base (Plate 1, Fig. 7), these concentric rings appear identical to Durham's (1949) thecal rings of polycyclic development. The rings described here are, however, structurally and ontogenetically different, since they are formed much later in development by raised costae and exothecal dissepiments, whereas polycyclic thecal rings are an early developmental feature involving overlapping of primitive thecal walls. Furthermore, there is no extension of the polyp into the compartments of the costal roots, whereas in polycyclic development, the polyp occupies the area created by the last thecal ring. The identical mode of basal reinforcement also occurs in *Phyllangia* and *Oxysmilia*.

*Etymology.*—The prefix is derived from the Greek *rhiza*, meaning root, and pertains to the concentric rings of root-like costal chambers around the base. Gender: feminine.





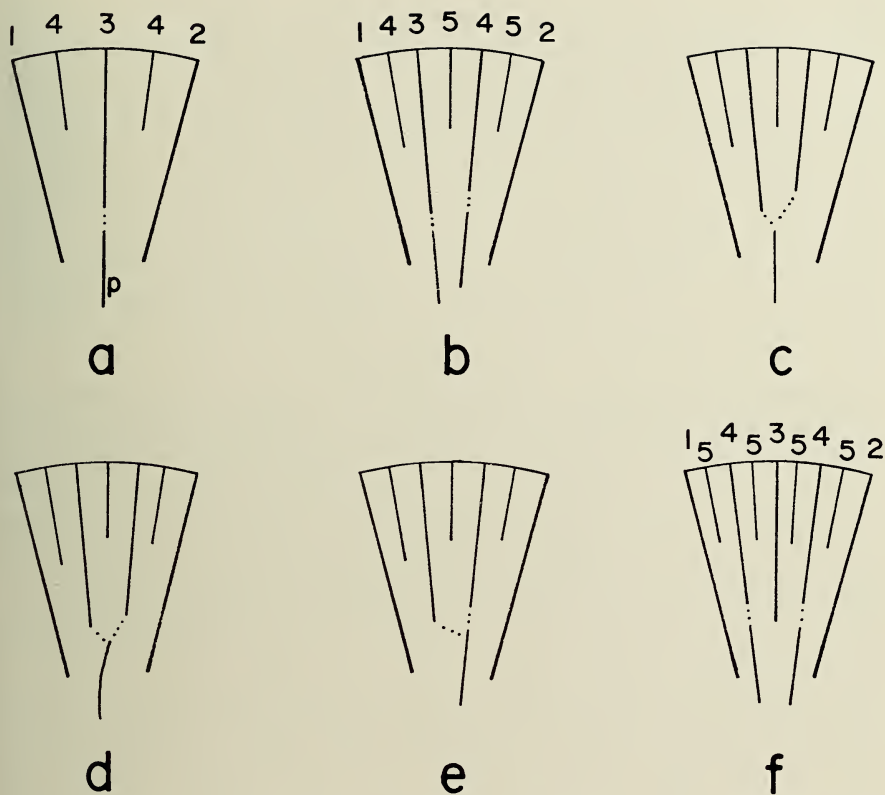


Fig. 1. Diagrams illustrating the maintenance of paliform lobes (p) before penultimate cycle of septa (see text). Only one half-system is illustrated; numbers 1-5 correspond to respective septal cycles. Dotted line represents trabecular connection of paliform lobe to adjacent septa.

*Rhizosmilia gerdae*, new species

Plate 1, Figs. 1-7

*Material examined*.—Types: USNM 46812, holotypic colony (13 corallites), USNM 46813, paratypes 36+ corallites), all from *Gerda-725*, 26°01'N,

Plate 1. 1. *Rhizosmilia gerdae* (holotypic colony): *Gerda-725*,  $\times 0.95$ , USNM 46812; 2. *R. gerdae* (paratype): *Gerda-725*,  $\times 3.0$ , USNM 46813; 3. *R. gerdae* (paratype): *Gerda-725*,  $\times 3.9$ , showing dissepiments, USNM 46813; 4-6. *R. gerdae* (calices of holotypic colony),  $\times 3.0$ , USNM 46812; 7. *R. gerdae* (paratype): *Gerda-725*,  $\times 3.8$ , cross-section through base, USNM 46813; 8. *Rhizosmilia maculata*: off Cozumel, Yucatan, 6.5 m,  $\times 1.5$ , showing dissepiments, USNM 46811.

79°10'W, 143–210 m, 3 August 1965; USNM 46814, paratype (1), *Gerda*-698, 26°28'N, 78°42'W, 165–329 m, 22 July 1965; USNM 46815, paratype (1), *Gerda*-701, 26°29'N, 78°40'W, 275–311 m, 22 July 1965; USNM 46816, paratypes (6 corallites), *Gerda*-702, 26°29'N, 78°40'W, 73–220 m, 22 July 1965; USNM 16138, paratypes (7 corallites), *Albatross*-2332, 23°10'38"N, 82°20'06"W, 285 m, 19 Jan. 1885; USNM 36364, paratypes (10 corallites), *Albatross*-2334, 23°10'42"N, 82°18'24"W, 123 m, 19 Jan. 1885; USNM 10210, paratype (1), *Albatross*-2336, 23°10'48"N, 82°18'52"W, 287 m, 19 Jan. 1885; USNM 36418, paratypes (14+ corallites), *Albatross* station unknown (off Havana, Cuba), 1885.—Other material: USNM 46817, 1 colony (4 corallites), *Albatross* station unknown (off Havana, Cuba), 1885; USNM 46818, 4 corallites, Caribbean Sea (no additional data).

*Description*.—The colony forms phaceloid clumps by extratentacular budding from a common basal coenosteum. Corallites are cylindrical or slightly tapered at the base. The base of a corallite increases in diameter by adding exothecal dissepiments over raised costae as previously described for the genus. A typical corallite measures 12 × 10 mm in calicular diameter and 21 mm tall, although adult corallites vary from 7–17 mm in greater calicular diameter and may be up to 45 mm tall. Costae are usually well-defined only in the upper half of the corallum where they are equal, low, rounded ridges separated by equally shallow grooves. Very small granules cover the costae.

Septa are arranged in 6 systems and 4–5 cycles. A corallite of 8–11 mm calicular diameter usually has a complete fourth cycle (48 septa), whereas, above 11 mm, pairs of  $S_5$  are common, but a complete fifth cycle is rare.  $S_1$  are usually slightly larger than  $S_2$ , exsert, and have straight, vertical inner edges that do not reach the columella. The remaining cycles are progressively smaller and less exsert;  $S_5$  are rudimentary with dentate inner edges. Low, blunt granules cover the septal faces.

A large paliform lobe, compressed in the plane of the septum, occurs before each septum of the penultimate cycle and maintains its position there as described in the generic discussion. Each paliform lobe is separated from its respective septum by a deep, narrow notch and together they form a crown deeply set in the fossa.

The columella is prominent and quite variable. It may be an elliptical, spongy mass, or linear, individualized pillars, or a single lamella. Endothecal dissepiments are abundant.

*Discussion*.—*R. gerdae* is very similar to *Rhizosmilia maculata* (Pourtales, 1874) n. comb., particularly in its growth form and aspects of its paliform lobes, dissepiments (Plate 1, Fig. 8), costal roots, and columella. It may be distinguished by the smaller size of its corallites (none known to exceed 15 mm in greater diameter), complete absence of  $S_6$ , absence of brown speckled pigmentation, and shallower fossa. Although they have overlapping

depth ranges, *R. gerdae* is more typical of the deeper shelf, whereas *R. maculata* is found in shallower waters (3–161 m). *R. maculata* is described and illustrated in Cairns (1977) as *Caryophyllia maculata*.

*Etymology*.—The specific name *gerdae* is given in honor of the University of Miami's R/V *Gerda*, aboard which many of the type-specimens were collected.

*Type-locality*.—Off Bimini, Straits of Florida: 26°01'N, 79°10'W, 143–210 m.

*Geographic distribution*.—Insular side of Straits of Florida.

*Bathymetric range*.—123–287 m (confirmed).

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